

Punton (J.)

INDEX
MEDICUS

THE RELATION OF THE

SCIENCE OF MEDICINE

TO

PUBLIC SCHOOL EDUCATION

BY JOHN PUNTON, M. D.

Professor of Mental and Nervous Diseases, University Medical College; Neurologist
to All Saints, Scarritt and German Hospitals, &c.



Read before the Tri-State Medical Society, at St. Louis, Mo., April 8, 1896.

Published by request of the Society.

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□ GENTLEMEN: The subject of education, in its highest and widest sphere, is daily becoming of more practical interest and importance.

In the evolution of civilization, there never was a time when its value, as a reforming agent, was at a greater premium than the present. Like all other powerful, reforming agents, the scope of education has been gradually enlarged by keeping step with the march of progress until today its elevating and preserving influence permeates all the ramifications of our business and social life.

Much therefore depends upon our interpretation of the true function of education, as well as its practical relation to the demands of our present life and modes of living. If education, in its broadest significance, embraces, as we are taught to believe by the leading educators of the world, all the elements which enter into and form part of our social fabric, then certainly its chief object is to train individuals to become intelligent, moral and self-supporting citizens, at the same time eradicate, or at least modify or correct, all undesirable tendencies in both mind and body which oppose such a favorable state.

This, therefore, concerns the development of the whole man, his mental, moral and physical powers and capacities, beside the recognition and cor-

rection of any abnormal or pathological tendencies which may seem to even lean toward his social degeneracy.

In view of such fact it is clear to all that the basic element of all true education is closely allied to the science of medicine; indeed, education is rapidly becoming a medical question of the highest importance, and at once becomes the duty of the physician to not only demonstrate, but promulgate its special significance and value to the individual pupil, as well as their parents and guardians.

The vital relation of medical science to the proper protection and preservation of the health of the race on the one hand and the prevailing vices and social evils on the other, together with their special relation to public school education is at once self-evident to every unbiased mind. That the truly medical aspect of public education has, until within quite a comparatively recent period, been entirely ignored or overlooked by our prominent educators, is now generally admitted.

The recognition and introduction of medical science in educational methods therefore marks a new era in the progress of civilization.

That serious defects in the recognition routine methods of public school education and training of pupils, not only formerly, but still exists, is attested by the general public as well as



the officers and teachers of the schools themselves.

One recent writer in the *Outlook* (see March 15, 1895,) commenting on this says: "That there are grave defects in our present school methods is denied by no one competent to express an opinion on the subject.

"One of the crying faults is the attempt to do too much in the schools. The course of study is overcrowded, and the result is that the scholar learns nothing thoroughly. The advocates of this method assert that it is best for a child to learn a little about a good many subjects, even if it is only the barest smattering. This is radically a wrong principle."

Again in a report just issued by the president of the board of education of Brooklyn, New York, among other things he says:

"The curriculum is overloaded with subjects ornamental and otherwise. Thus the children are hurried along from one subject to another with results that are disastrous to them and disheartening to their teachers."

In the *Atlantic Monthly* for last July (1896) the editor invited a number of principals of public schools to frankly relate their careers as teachers and confess their grievances.

These confessions of public school teachers, selected at random from all parts of the country, go to show that there are grave defects in our present educational methods which they claim are largely accounted for "by the extent of the local politicians in many parts of the country keep their hold on the appointments of teachers, as well as the pernicious influence exerted by the publishers of text books in the selection and retention of incompetent school officers and teachers."

"All of the writers confess that their own training was inadequate and that the teachers who now enter the profession have also been inadequately trained."

M. J. Savage, writing in the *North American Review*, sums up an elaborate article on the defects of the public school system as follows:

"I propose now to re-enforce the opinions so far expressed by a few definite specifications and statistics.

"The defects of our present common school system may be summed up under two heads; 1st, it attempts to do too much and goes beyond its legitimate province; 2d, while trying to do what properly lies beyond its own borders, it fails to produce satisfactory fruits within its own field.

"In trying to do too much the system fails in doing what it might and at least, ought to attempt on behalf of the great and overwhelming majority."

"It does not give him the best instruction and training for the real life which they must lead. As already shown, their success in life depends on the practical knowledge of their own bodies and on moral training much more largely than on most things which they are actually taught. And in these two directions almost nothing is being done."

In one of the recent editorials of a prominent New York religious weekly (see New York *Christian Advocate, Methodist*,) the editor justly criticises the action taken by the New York Teachers' association, at their meeting held at Syracuse, New York, when they passed a series of resolutions condemning the passage of a law requiring the compulsory teaching of physiology in the public schools. Here

is what they say: "Whereas, the legislature has placed upon the statute book a new law concerning the teaching of physiology, a law contrary to all principles of correct teaching, opposed to all school laws and customs, interfering as it does with the sources of study and with the details of school work; therefore, be it resolved, that the New York State teachers denounce that law as an insult to the teachers of the State and a menace to the principles of free school teaching," etc.

No wonder the editor was led to remark, "Considering their position as instructors of youth in the pay of the public, and the far-reaching character of their influence, through their example and spirit, they might have written in better style such resolutions as they saw fit to pass."

"The first resolution is grossly improper and introduces a personal element which weakens their position and will create an antagonism on the part of the legislature to themselves." I have purposely seen fit to cite these numerous opinions in order to prove that it is not my purpose to make any imaginary criticisms or introduce any personal charges, or even conjure for this occasion some undeserved remarks, but simply wish to show that not only the public recognize that serious defects exist in the present school system, but also members of their own profession which no doubt often handicap their own best efforts.

The object of this paper, therefore, is not intended to antagonize, but rather co-operate in an endeavor to overcome many existing evils. By such a process of reasoning together it is more than possible much good can be accomplished by emphasizing the importance of the relation of the science

of medicine to public school education on the one hand and the purely pedagogic relation on the other.

From the foregoing it is clear to all that reforms are needed, and while many plans have been devised, it seems to me none have met the indications like the practical, philosophical principles embodied in the new medical psychology, the basis of which recognizes the education of pupils from a purely physiological, or medical, standpoint.

The great question today with the leading educators of the world then is not so much what a pupil can be forced to accomplish in a given length of time as what are his or her capacities to safely study and acquire that kind of knowledge which is most essential for their own physical, mental and moral preservation and that of their fellow-man, and this, I take it, embodies the chief elements of good citizenship, which is, or should be, the prime object of all true education.

That this great question can be solved more satisfactorily by the methods embraced in medical psychology I think there can be no doubt. It is, therefore, fitting for us to briefly review some of its more practical aspects which, so far, has been clearly demonstrated in the public school. Without any desire to burden you with unnecessary detail, it may be said that this great movement had its origin in Europe, and having run the gauntlet of bitter prejudice and ridicule for many years, during which time it gradually demonstrated its scientific accuracy and usefulness, was finally, in its more matured state, transported to America, no longer than fifteen years ago.

To G. Stanley Hall of the Johns Hopkins University more than perhaps

to any other man are we indebted for not only its introduction, but also very largely its present state of development and efficiency.

With an extremely modest beginning it has grown under his sagacious leadership and those of his pupils until today no first-class educational institution is complete in all its details without its psychological laboratory.

One of the chief departments which belong to this new psychology is the science which treats of the physical and intellectual characteristics of the different races of mankind, and technically known as "Anthropology." Its extensive range admits of subdivision, the chief of which, perhaps, is Anthropometry, or the science which relates to the measurements of the human body.

Having become interested in its practical utility as a means of determining certain physical standards for certain ages in the period of school life and work, and more especially those ranging from 13 to 21, as well as their relation to the adjustment of proper school tasks, based on the physiological principles which takes cognizance of the pupil's individual strength and capacity, I applied to the board of education for permission to make certain anthropometrical investigations in the Kansas City High school, which was granted. In order to ensure accuracy, I called to my aid Dr. F. L. Riley, physical director of the Y. M. C. A., together with several medical students, and I now take pleasure in presenting to you a partial report of our findings.

It is now about two years since we commenced our work, and the progress while being somewhat slow, has been very thorough and complete in all its details.

In a paper which I read before our local society about four years ago, I stated it was my firm conviction that the age of a child when taken as a criterion for its mental strength and capacity was a very erroneous one and full of deception, and that it was far more logical and scientific to allow the height and body weight of a pupil to govern this important question.

This statement, which at the time was received somewhat in the light of a joke and regarded as a pretty theory, but very impracticable, has become eminently true and intensely practical when actually applied in the school room. Moreover, in my original paper I also called attention to the fact that it was my firm conviction that the local city authorities are too prone to ignore medical aid in their sanitary and educational legislation. No class of persons are better prepared to offer more useful advice in such matters than the well trained, educated, scientific physician, more especially is this true of education; and I then stated that it was my belief that a wisely-selected medical board should be appointed in every city and town whose duties should be to visit the public schools and inspect the pupils and determine their physical condition as well as their capacity for study, and I also gave you several good reasons for entertaining such a view. This statement was also received with more or less contempt and ridicule, but strange as it may appear, in less than twenty months from that time this very principle was put in practical operation in no less a place than the so-called center of American culture, viz., Boston, and today it affords me pleasure to present to you an extract from the first report just issued of the results of the

medical inspection of the Boston public schools.

MEDICAL INSPECTION OF BOSTON SCHOOLS

A report recently issued by the State department shows that the inspection of the Boston schools by physicians has been followed by excellent results. The schools have been visited daily, and all of the children who have complained of illness or appeared to the teachers to be ill have been examined by the visiting physicians who, in all cases, advises the teacher what to do with the pupil. The report says:

"This work has been progressing for fourteen months and it has demonstrated that there are many cases of contagious diseases in the schools, and large numbers of school children whose illness and whose disposition by the teacher requires the decision of a competent physician. For the fourteen months ending December 31, 1895, 16,790 pupils were examined, 10,737 of whom were found to be ill; 6,053 were found not to be ill, and 2,041 of these were too ill to remain in school for the day. There were 77 cases of diphtheria, 28 of scarlet fever, 116 of measles, 28 of chicken-pox, 69 of pediculosis, 47 of scabies, 47 of mumps, 33 of whooping cough and 8 of congenital syphilis in children sitting in their seats and spreading these diseases to other children. The remaining 10,372 sick children were suffering from a large variety of diseases."

These results justify the work so far and show the need of extending it. A corps of medical inspectors, sufficiently large to permit an intelligent physician to spend at least a few minutes daily in every school room, would detect many cases needing attention, yet not enough apparent to the average

teacher, and of bad sanitary conditions that go unheeded from month to month. Much of the sickness and enfeebled state of school children is due to the condition of their school rooms. Children sit with cold or damp feet because the heating apparatus affords no chance to warm or dry feet, and they suffer from insufficient light and ventilation, when both might easily be provided.

New York city has also lately followed in the wake of Boston in appointing medical inspectors of public, parochial and private schools for the purpose of reducing the number of cases of contagious diseases. Each child is to be examined daily, and when absent because of sickness, the nature of the sickness will be investigated. The press reports say that many prominent physicians have applied for appointment on the staff. The office of inspector is worth \$300 a year. Among the applicants for this position is a professor in one of the medical colleges. The applicants for appointment on the staff are of both sexes, but President Wilson will give preference to the summer corps of physicians. Provision is made for a staff of 150 at \$30 a month. The chief inspector will receive \$2,500 a year. Competitive examinations will determine who are to have the places. President Wilson recommends that the summer corps be not required to pass examination. He will also recommend that the competitions be by districts, so that the physician appointed be residents of the districts in which they are to serve.—*Kansas Medical Journal*, Jan. 30, 1897.

You will observe that these reports largely pertain to the prevention of contagious diseases, and while I believe this to be a step in the right direction

and deserves the hearty co-operation of the entire medical world, yet I am certain that there are other prophylactic measures equally as necessary to enforce both in and out of the school room which the science of medicine plainly teach before we can successfully overcome the production and spread of disease among the pupils of our public schools. In my judgment a very important agent and one which so far has been very largely ignored in the prevention of diseases among school children is the enforcement of the principles embodied in the science of Anthropometry. In almost every large city in the world Anthropometrical investigations have now been made in the public schools, and the unanimous verdict has been reached that the mental output of the pupil is directly related to their height, weight and physical measurements, and that there is a physical basis for precocity on the one hand and mental dullness on the other.

What is necessary to be done then, as I stated in my original paper, is to fix certain definite standards of weight and measurements for every age and height, and any pupil found to be below or above this fixed standard should be treated accordingly.

In this way it would be possible to greatly aid the proper physical and mental development of the pupil by assigning to each appropriate studies besides overcome, to some extent at least, much of the disease incident to school life and work.

The practical utility of such a method has already been ably demonstrated in a series of charts by Dr. Dudley A. Sargent of Harvard University and Dr. Seaver of Yale, both of whom have been engaged in this work for

some time, and by which it is now possible for us to compare the health and general physical condition of the boys and girls of Boston with those of our own and other cities.

It was our desire to make investigations along similar lines in Kansas City, and for this purpose we selected at random from the general assembly hall of the High school 200 boys and a similar number of girls, whose ages ranged from 13 to 21, and subject them to a similar examination as pursued in other large schools.

The results of our investigations proved conclusively that out of 200 boys examined 34 per cent. were found to possess a nervous temperament as demonstrated by either a history of direct inheritance or the character of the pulse, and 35 per cent of these were found to be subject to physical defects.

When the measurements of these children are compared with Dr. Sargent's chart of the Boston boys of the same age we find that the weight of our boys was 6 3-10 pounds less and the height 9-10 of an inch less than the Boston boys, while the heart rate was also 6 beats per minute faster.

Not only were these nervous children found to be deficient in weights and measurements, but the general average of all the boys examined were found to be in nearly every instance deficient in weight, height and other vital measurements.

For instance, the average weight of the Kansas City High school boy at the age of 16 is 126 pounds, against 132 3-10 pounds of the Boston boy, while the average height of Kansas City boy is 5 feet 6 7-10 inches, as against 5 feet 7½ inches of the Boston boy, a clear loss of 8-10 of an inch. Again the girth of the neck, which is

considered one of the most vital measurements of the body, was also deficient. Besides this the breadth of the shoulders was found to be deficient to the extent of 8-10 of an inch. The expansion of the chest, which is also a valuable guide to the lung capacity, was found to be $\frac{1}{2}$ an inch smaller than the Boston boys of the same age.

In nervous force, which was measured by dynamometer, we found to be equal with the Eastern boys of the same age, which would suggest, at least in view of all the other deficiencies, that our boys were using more nervous force at the expense of their physical strength than are their Boston friends.

The average heart beat of nine-tenths of the boys examined in our High school was 84, which is entirely too rapid for health, and is in itself an indication of physical weakness.

In comparing the results of Mr. Greenwood's (Superintendent of School) measurements taken in 1886 and again in 1890, with those of Dr. Sargent of Harvard, we find that the comparative weight and height at the same ages of the Kansas City and Boston pupils were as follows:

KANSAS CITY.

Age.	Weight.	Height.
14.....	92 2-10 lbs.	4 ft. 10 $\frac{1}{2}$ in.
15.....	107 3-10 lbs.	5 ft. 2 8-10 in.
16.....	119 lbs.	5 ft. 3 9-10 in.
17.....	126 6-10 lbs.	5 ft. 4 8-10 in.
18.....	136 8-10 lbs.	5 ft. 6 6-10 in.

BOSTON.

Age.	Weight.	Height.
14.....	99 $\frac{1}{2}$ lbs.	5 ft. 2 in.
15.....	112 lbs.	5 ft. 5 in.
16.....	132 lbs.	5 ft. 7 $\frac{1}{2}$ in.
17.....	134 $\frac{1}{2}$ lbs.	5 ft. 7 6-10 in.
18.....	135 lbs.	5 ft. 7 8-10 in.

This proves that with but one exception the weights and measurements taken by Mr. Greenwood as well

as our own were much less than those found in the chart of Dr. Sargent's for the same ages.

What causes the school children of Kansas City to be so very inferior from a physical standpoint than the Boston children is a problem not easy to solve.

It has been suggested, however, that it might be due to climate, and in support of this it is asserted that during the war the Southern soldiers were very much smaller in stature and general physique than were the Northern ones.

It is also claimed that even today the school children of the South are smaller in every way than are our own.

Another reason assigned for these apparent grave physical defects is that the percentage of foreign-born children are greater in our schools than those of the East, but this view cannot be sustained by facts, for we find it to be less than 20 per cent.

Still another view is that our Eastern friends are much slower in their movements and take life more easy than we do, hence their development, as well as their children, is more in accord with physiological law, but the most important view to us is that the children of Boston are compelled to take systematic physical culture as part of their school routine, and that the good effects physically is more generally recognized by the masses in the East than in the West.

Let this be as it may, there are several other good reasons which might at least suggest the cause. For instance, if the statement made by our recent visitors from New York be true, viz.: That in their opinion the Kansas City High school was unexcelled in this country for its high standard of proficiency, then it would seem to sug-

gest that possibly its high standard of excellence was gained at the physical expense of its pupils, just on the same principle that a minister of the gospel gets the credit of building a church, when in reality it is built at the expense of its members, due possibly to the minister's ability to increase the spiritual zeal and zest of the membership.

Many a school undoubtedly gets its reputation of excellence at the expense of its various teachers' ability to extract the greatest amount of brain tension from its pupils in a limited length of time, hence it is that I learn from good authority that the teachers of this school place a premium on their examinations by grading them in three classes, viz., the highest, middle and lowest grade, consequently the pupils naturally strive their utmost to gain the first place rather than have their apparent ignorance exposed to the world.

The shock to the nervous system from failure to reach the coveted prize cannot be overestimated, and no one has a better opportunity to know the evil results of such a practice than the family physician.

From the foregoing it is evident to all unbiased minds that there never was a time when the brakes needed applying more than the present, and it becomes the duty of the medical profession to sound the alarm and insist on their application.

But while many faults may be found with our present school system of education, it is not by any means all due to the officers and teachers of schools themselves, but in my opinion the chief difficulty can be directly traced to the parents and guardians as well as the home life of the pupil.

Many a child is compelled by its parents to sacrifice its constitution for what is deemed by them its educational necessities.

In their anxiety to have their child excel and appear smart the parents are willing to witness its slow but certain death from sheer exhaustion, due to overpressure by thus making its physical health subservient to the intellect. The parents are even known to employ private teachers to coach their children after the regular school hours, besides depriving them of many a legal holiday.

If their child happens to be "put back" from any cause by the teacher they then make a move to have him or her displaced on the ground of incompetency. It is here where I think the medical profession can be of valuable service to not only the teacher, but the child, by being a just mediator, and armed with all the authority to decide such questions, instead of appealing to either the parents or the teacher.

What our present system needs to fear then more perhaps than anything else are the home influences of the children and their over-zealous parents' lack of knowledge of the evil effects of excessive mental and physical strains.

The relation of the science of medicine to public school education then is rapidly becoming of more practical interest and importance, and the duty of the physician is not fulfilled or complete when he fails to recognize this particular part of his function, for in the light of facts who can truthfully argue that it is not the business of the physician to at least advise, if not dictate, in matters pertaining to the general education of the rising generation.

That the education of children is rapidly becoming a question which must largely be referred to scientific medical methods is plain to every thoughtful person, and the longer the medical aspect of education is ignored by our educators the greater the evil will become.

